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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,569	07/24/2003	Kazuhiro Tomita	108075-00115	8110

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EXAMINER	
HANNON, CHRISTIAN A	
ART UNIT	**PAPER NUMBER**
2685	

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/625,569	TOMITA, KAZUHIRO	
	Examiner	Art Unit	
	Christian A. Hannon	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *16-19* is/are allowed.

6)☒ Claim(s) *1-10 and 12-15* is/are rejected.

7)☒ Claim(s) *11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: on page 2, line 7 the acronym "BFP" is incorrect and should be changed to "BPF". On page 6, line 32, the description of fig. 2 is recited as "a first embodiment" when in actuality the first embodiment is shown in fig. 1; as verified from page 12, lines 5-7. Similarly on page 7, line 2; "a first embodiment" is recited when in actuality it should read "a third embodiment" according to the description on page 13, lines 19-21.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 6-8, 15 rejected under 35 U.S.C. 102(e) as being clearly anticipated by Luo et al (US 2003/0203724), herein Luo.

In regards to claim 1 Luo teaches a semiconductor device for a receiver having a reference oscillator, wherein the receiver uses a reference signal generated by the reference oscillator to receive signal in a predetermined channel bandwidth, the semiconductor device comprising, a local oscillator for generating a local signal having

a local frequency (Figure 2, Item 216), a PLL controller connected to the local oscillator for controlling the local frequency in accordance with the reference signal to set the channel bandwidth (Page 3, [0042]) and a comparator (Figure 2, Item 210) connected to the local oscillator for comparing frequency of the received signal with frequency of the reference signal or phase of the received signal with phase of the reference signal and generating an error signal in accordance with the comparison to correct the local frequency (Page 2, [0037-0039]).

Regarding claim 3, Luo teaches the semiconductor device according to claim 1, wherein the receiver is provided with a transmitting function, and the local oscillator functions as a modulator when the receiver transmits a signal (Page 2, [0017]).

In regards to claim 6, Luo teaches a semiconductor device for a receiver having a reference oscillator, wherein the receiver uses a reference signal generated by the reference oscillator to receive a signal in a predetermined channel bandwidth, the semiconductor device comprising a local oscillator (Figure 2, Item 216) for generating a local signal, a first control loop (Figure 2, LOOP 1) including the local oscillator for controlling a frequency of the local signal based on the reference signal to set the channel bandwidth (Page 3, [0042]) and a second control loop (Figure 2, LOOP 2) including the local oscillator for comparing frequency of the received signal with frequency of the reference signal or phase of the received signal with phase of the reference signal and generating an error signal in accordance with the comparison to correct the local frequency (Page 2, [0037-0039]).

Regarding claim 7, Luo teaches the semiconductor device according to claim 6, further comprising, a loop switching circuit connected to the local oscillator to selectively validate the first control loop and the second control loop, wherein the loop switching circuit invalidates the first control loop and validates the second control loop after setting the channel bandwidth with the first control loop (Page 3, [0050-0052]; Figure 4).

In regards to claim 8, Luo teaches the semiconductor device according to claim 6, wherein the receiver includes a band pass filter for setting a channel bandwidth of the received signal, the semiconductor device further comprising, a frequency controller (Figure 2, Item 212) connected to the band pass filter (Figure 2, Item 214) to set a center frequency of the band pass filter to a frequency corresponding to the channel bandwidth in accordance with the reference signal before the second control loop corrects the local frequency (Page 3, [0047-0048]). It is further noted that while Luo does not explicitly state that loop filter is a 'band pass filter' its function is equivalent to that of a band pass filter as is evident from the aforementioned citation.

In regards to claim 15, Luo teaches a receiver for receiving a signal, the receiver comprising, a reference oscillator for generating a reference frequency signal having a reference frequency (Figure 2, Item 104), a local oscillator for generating a local signal (Figure 2, Item 216), a band pass filter having a predetermined passage bandwidth (Figure 2, Item 214; Page 3, [0047-0048]), a channel setting circuit connected to the reference oscillator and the local oscillator for controlling frequency of the local signal in accordance with the reference frequency signal and setting the passage bandwidth of the band pass filter to a predetermined channel bandwidth (Page 3, [0042]), and a

frequency correction circuit for comparing frequency of the received signal received in the channel bandwidth with frequency of the reference signal or phase of the received signal with phase of the reference signal and generating an error signal in accordance with the comparison to correct the frequency of the local signal (Page 2, [0037-0039]).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2, 4, 5, 9, 10, 12, 13 & 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Luo in view of Scarpa (US 5,487,186).

In regards to claim 2, Luo teaches the semiconductor device according to claim 1, however Luo fails to teach a demodulator for demodulating the received signal to generate a carrier signal, wherein the comparator compares frequency of the carrier signal with frequency of the reference signal or phase of the carrier signal with phase of the reference signal to generate the error signal in accordance with the comparison. Scarpa teaches a demodulator for demodulating the received signal to generate a carrier signal, wherein the comparator compares frequency of the carrier signal with frequency of the reference signal or phase of the carrier signal with phase of the reference signal to generate the error signal in accordance with the comparison (Column 7, Lines 45-57; Column 9, Lines 4-26; Scarpa). It would have been obvious to modify Luo to include a modification wherein the comparator compares frequency of the

carrier signal with frequency of the reference signal or phase of the carrier signal with phase of the reference signal to generate the error signal in accordance with the comparison, such as that taught by Scarpa, in order to achieve carrier feedback control.

Regarding claim 4, Luo teaches the semiconductor device according to claim 1, however Luo does not teach a signal generator for generating a modulation signal having a frequency corresponding to the error signal and a quadrature modulator connected to the signal generator and the local oscillator to modulate the local signal with the modulation signal. Scarpa teaches a signal generator for generating a modulation signal having a frequency corresponding to the error signal (Figure 5, Items 111,120 & 144; Column 9, Lines 4-26; Scarpa) and a quadrature modulator connected to the signal generator and the local oscillator to modulate the local signal with the modulation signal (Figure 5, Item 104; Scarpa). It would have been obvious to modify Luo to include a modification further comprising a signal generator for generating a modulation signal having a frequency corresponding to the error signal and a quadrature modulator connected to the signal generator and the local oscillator to modulate the local signal with the modulation signal, such as that taught by Scarpa, in order to achieve quadrature modulation.

In regards to claim 5, Luo in view of Scarpa teaches the semiconductor device according to claim 4, furthermore Luo teaches wherein the receiver is provided with a transmitting function, and the quadrature modulator functions as a modulator when the receiver transmits a signal (Page 2, [0017]; Luo).

Regarding claim 9, Luo teaches a semiconductor device for a receiver having a reference oscillator, wherein the receiver uses a reference signal generated by the reference oscillator to receive a signal of a predetermined channel, the semiconductor device comprising, a local oscillator for generating a local signal (Figure 2, Item 216; Luo) and a PLL controller (Page 3, [0042]; Luo) connected to the local oscillator for setting a frequency of the local signal with the reference signal to receive the received signal of the predetermined channel. However Luo does not teach a mixer connected to the local oscillator for generating an intermediate frequency signal having a predetermined intermediate frequency with the local signal and the received signal or a comparator connected to the local oscillator for comparing a frequency of the intermediate frequency signal with frequency of the reference signal or phase of the intermediate frequency signal with phase of the reference signal and generating an error signal in accordance with the comparison to correct the frequency of the local signal. Scarpa teaches a mixer connected to the local oscillator for generating an intermediate frequency signal having a predetermined intermediate frequency with the local signal and the received signal (Figure 5, Item 104; Column 9, Lines 4-26; Scarpa) and a comparator (Figure 5, Item 142; Column 9, Lines 4-26; Scarpa) connected to the local oscillator for comparing a frequency of the intermediate frequency signal with frequency of the reference signal or phase of the intermediate frequency signal with phase of the reference signal and generating an error signal in accordance with the comparison to correct the frequency of the local signal. The reference signal here is being interpreted as the Lock signal (Figure 5, Item 138; Scarpa). It would have been

obvious to modify Luo to include a mixer connected to the local oscillator for generating an intermediate frequency signal having a predetermined intermediate frequency with the local signal and the received signal or a comparator connected to the local oscillator for comparing a frequency of the intermediate frequency signal with frequency of the reference signal or phase of the intermediate frequency signal with phase of the reference signal and generating an error signal in accordance with the comparison to correct the frequency of the local signal, such as that taught by Scarpa, in order to achieve IF feedback control.

Regarding claim 10, Luo and Scarpa teach the semiconductor device according to claim 9, furthermore Scarpa teaches a band pass filter connected to the mixer, wherein the band pass filter has a predetermined passage bandwidth through which the intermediate frequency signal passes (Figure 2, Item 110; Column 7, Lines 9-16; Scarpa) and a demodulator (Figure 2, Item 116; Scarpa) connected to the band pass filter for demodulating the IF signal to generate a carrier signal. Luo teaches wherein the comparator compares frequency of the carrier signal with frequency of the reference signal or phase of the carrier signal with phase of the reference signal and generates the error signal in accordance with the comparison to correct the frequency of the local signal (Page 2, [0037-0039]; Luo).

In regards to claim 12, Luo and Scarpa teach the semiconductor device according to claim 10, furthermore Luo teaches a frequency controller (Figure 2, Item 212; Luo) connected to the band pass filter (Figure 2, Item 214; Luo) and the reference

oscillator (Figure 2, Item 104; Luo) to set a center frequency of the band pass filter to the intermediate frequency with the reference signal (Page 3, [0047-0048]; Luo).

In regards to claim 13, Luo and Scarpa teach the semiconductor device according to claim 9, Luo teaches the device further comprising, a switching circuit connected to the local oscillator to selectively connect the PLL control circuit and the comparator to the local oscillator (Page 3, [0050-0052]; Figure 4).

Regarding claim 14, Luo and Scarpa teach the semiconductor device according to claim 9, Luo further teaches wherein the receiver is provided with a transmitting function, and the local oscillator functions as a modulator when the receiver transmits a signal (Page 2, [0017]).

Allowable Subject Matter

6. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 16-19 are allowed.

In regards to claim 16, Scarpa teaches a method for correcting frequency of a local signal in a receiver wherein the method comprises generating a local signal for receiving a received signal of a predetermined channel with the reference signal, generating an IF signal having a predetermined IF with the received signal and the local signal, providing the signal to the BPF and generating an error signal in accordance with a comparison between frequency of the IF signal that passed through the BPF and frequency of the reference signal or a comparison between phase of the IF signal with

phase of the reference signal and correcting the frequency of the local signal in accordance with the error signal (Column 3, Lines 23-65; Scarpa). Scarpa fails to teach the varied setting of the center frequency of the bandpass filter.

Claims 17-19 are allowed as they are based on allowable independent claim 16.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kaufmann et al (US 2003/0050029) disclose a fast locking wide band frequency synthesizer.

Goldman (US 2003/0119466) discloses a fully integrated low noise multi-loop synthesizer with fine frequency resolution for HDD read channel and RF wireless local oscillator applications.

Parisel et al (US 6,735,425) disclose a telephone with a demodulator circuit with an improved local oscillator.

Forrester (US 2002/0173284) discloses a reference oscillator.

Hoi (US 2003/0181182) discloses a receiver for wireless transmission systems.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian A. Hannon whose telephone number is (571) 272-7385. The examiner can normally be reached on Mon. - Fri. 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christian A. Hannon
November 7, 2005

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